

REMARKS

I. Introduction

In response to the pending final Office Action, Applicants have incorporated the limitations of claims 4 and 5 into independent claim 1. No new matter has been added.

For the reasons set forth below, Applicants respectfully submit that all pending claims as currently amended are patentable over the cited prior art.

II. The Rejection Of Claims 1, 4 And 5 Under 35 U.S.C. § 103

Claims 1, 4 and 5 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Eylem et al. (USP No. 7,049,030) in view of Noriyuki et al. (JP 2000-082503). Applicants respectfully traverse this rejection for at least the following reasons.

Amended independent claim 1 recites an alkaline battery comprising a negative electrode having a negative electrode mixture. The negative electrode mixture contains a zinc alloy as an active material, the zinc alloy containing at least aluminum, an alkaline electrolyte, and a positive electrode. The alkaline electrolyte comprises an aqueous KOH solution and LiOH and aluminum hydroxide that are dissolved in the aqueous KOH solution. A portion of the alkaline electrolyte is contained in the negative electrode mixture, and the amounts of the LiOH and the aluminum compound contained in the portion of the alkaline electrolyte in the negative electrode mixture are 0.1 to 2 wt % and 0.001 to 0.2 wt % of the negative electrode mixture, respectively. The weight ratio of the alkaline electrolyte to the zinc alloy of the negative electrode is 0.1 to 2, and the positive electrode comprises manganese dioxide as a positive electrode active material.

Features of amended independent claim 1 are that the negative electrode contains an alkaline electrolyte having LiOH and aluminum hydroxide contained in the portion of the

alkaline electrolyte in the negative electrode mixture in an amount of 0.1 to 2 wt % and 0.001 to 0.2 wt % of the negative electrode mixture, respectively. The weight ratio of the alkaline electrolyte to the zinc alloy of the negative electrode is 0.1 to 2, and the positive electrode comprises manganese dioxide as a positive electrode active material. As such, an alkaline battery having excellent discharge capacity may be obtained by setting the concentration of aluminum hydroxide in the electrolyte and the weight ratio of the whole electrolyte to the zinc alloy.

In the Response to Arguments section, the Examiner asserts that the evidence of unexpected results set forth in the previous response of November 4, 2011 was not demonstrative because the Example A1-A4, A13, A14, B1-B4, B13, B14, C1-C4, C13 and C14 were not commensurate in scope with the present disclosure or the prior art. Applicants agree that these examples are not within the claimed scope. In fact, Applicants explicitly stated that “all materials outside the claimed range of aluminum hydroxide (i.e., A1-A4, A13-A14, B1-4, B13-B14, C1-C4 and C13-C14) have far inferior characteristics compared to batteries with aluminum hydroxide within the claimed range (i.e., A5-A12, B5-B12, and C5-C12)”. Applicants were showing the criticality of the claimed ranges to those outside the claimed ranges, which was done.

Moreover, as was previously argued, it is known to those skilled in the art that the elements added to zinc, specifically Bi, In, Ca, Sn and Pb, act to increase the hydrogen overvoltage of the zinc and thereby to improve the corrosion resistance of the zinc. Thus, the addition of these elements can further suppress gas reduction. As such, the effect shown in Tables 2 and 3 is not influenced by which of these elements is added to zinc.

Furthermore, it was asserted in the Response to Arguments that Applicants have not shown evidence that shows the smaller range of 0.001 to 0.2 wt% and less than 1 wt% because claim 1 does not require a specific electrolyte/zinc alloy weight ratio, as recited in original claim 4. Applicants have amended claim 1 to include a specific electrolyte/zinc alloy weight ratio of claim 4. In addition, the claimed ratio of the alkaline electrolyte to the zinc alloy of the negative electrode being 0.1 to 2 has been demonstrated in Table 3, previously submitted in the response of November 4, 2011. As such, since the Examiner admitted that neither Eylem nor Noriyuki teaches or discloses a ratio of the alkaline electrolyte to the zinc alloy of the negative electrode being 0.1 to 2, and as Table 3 clearly shows the superiority of the claimed ratio range, Applicants submit that the claimed range is allowable over the cited prior art.

For example, the first two and last two examples (which are outside the claimed ratio range) in each of the A7, B7 and C7 batteries show either inferior P% values or discharge capacity values as compared to the four middle examples, which are within the claimed ratio range. As such, Applicants have demonstrated the non-obviousness of claim 1 by the showing of unexpected, superior results based on data that is commensurate in scope with the claims.

In addition, it is alleged that Eylem teaches an amount of aluminum of less than 1%. Applicants previously argued that col. 4, lines 12-14 of Eylem states that the amount of aluminum is from 1 to 8 wt%. While lines 19-20 of col. 4 states that "less aluminum can be used", this does not disclose the precise range of 0.001 to 0.2% as recited in amended independent claim 1 of the present disclosure. Rather, Eylem is directed to eliminating the disadvantage that active copper material included in the positive electrode is dissolved in the concentrated alkaline electrolytic solution to form a copper-aluminum compound which is insoluble in the electrolytic solution. As a result, the solubility of the copper material is lowered.

Thus, the statement that “less aluminum can be used”, refers to a relatively unconcentrated alkaline electrolyte solution. However, one skilled in the art would not interpret this to mean that Eylem is referring to such a low concentration as that recited in present claim 1 of 0.001 to 0.2 wt%. As such, Eylem fails to disclose the range of aluminum oxide required by claim 1.

Furthermore, Noriyuki fails to remedy this deficiency. As such, Applicants submit that the combination of Eylem and Noriyuki fail to render the present claims obvious.

In order to establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. As Eylem and Noriyuki fail to teach or suggest a negative electrode including a negative electrode mixture that contains an alkaline electrolyte, wherein said alkaline electrolyte comprises an aqueous KOH solution and LiOH and aluminum hydroxide that are dissolved in said aqueous KOH solution, wherein a portion of the alkaline electrolyte is contained in the negative electrode mixture, and wherein the amounts of the LiOH and the aluminum hydroxide contained in the portion of the alkaline electrolyte in said negative electrode mixture are 0.1 to 2 wt % and 0.001 to 0.2 wt % of the negative electrode mixture, respectively, wherein the weight ratio of the alkaline electrolyte to the zinc alloy of the negative electrode is 0.1 to 2, and the positive electrode comprises manganese dioxide as a positive electrode active material, it is submitted that Eylem and Noriyuki do not render amended independent claim 1 obvious. Accordingly, Applicants submit that claim 1 is allowable and patentable over the cited prior art.

III. All Dependent Claims Are Allowable Because The Independent Claim From Which They Depend Is Allowable

Under Federal Circuit guidelines, a dependent claim is nonobvious if the independent claim upon which it depends is allowable because all the limitations of the independent claim are

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contained in the dependent claims, *Hartness International Inc. v. Simplimatic Engineering Co.*, 819 F.2d at 1100, 1108 (Fed. Cir. 1987). Accordingly, as amended claim 1 is patentable for the reasons set forth above, it is respectfully submitted that all pending dependent claims are also in condition for allowance.

IV. Conclusion

Having fully responded to all matters raised in the Office Action, Applicants submit that all claims are in condition for allowance, an indication of which is respectfully solicited.

To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 500417 and please credit any excess fees to such deposit account.

Respectfully submitted,

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